

Brian L. Tierney

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Education

- M.S. Computer Science, San Francisco State University, 1990
- B.A. Physics, Minor in Computer Science, The University of Iowa, 1985

Positions

- Staff Scientist, Lawrence Berkeley National Laboratory, California, 1990 – Present
- Visiting Scientific Associate, CERN, Geneva, Switzerland 2000-2001
- Research Associate, Lawrence Berkeley National Laboratory, California, 1989 - 1990

Research Interests

High-performance networking and network protocols; distributed system performance monitoring and analysis; network tuning issues; data intensive computing and high performance storage systems; cyber security and intrusion detection systems; the application of distributed computing to problems in science and engineering.

Narrative

Brian L. Tierney is a Staff Scientist and group leader of the Advanced Network Technologies Group in ESnet. Prior to this he was group leader of the Data Intensive Distributed Computing Group in the Distributed Systems Department at LBNL. He has been the PI for several DOE research projects in network and Grid monitoring systems for data intensive distributed computing.

Recent Publications

- “Hybrid Networks: Lessons Learned and Future Challenges Based on ESnet4 Experience”, Inder Monga, Chin Guok, William E. Johnston, and Brian Tierney, *IEEE Communications Magazine*, May 2011.
- “Multilayer Networks: An Architecture Framework”, Tom Lehman, Xi Yang, Nasir Ghani, Feng Gu, Chin Guok, Inder Monga, and Brian Tierney, *IEEE Communications Magazine*, May 2011.
- “perfSONAR: Instantiating a Global Network Measurement Framework”, Brian Tierney, Jeff Boote, Eric Boyd, Aaron Brown, Maxim Grigoriev, Joe Metzger, Martin Swany, Matt Zekauskas, and Jason Zurawski, *SOSP Workshop on Real Overlays and Distributed Systems (ROADS '09)*, October 2009. LBNL-1452E
- “Deploying distributed network monitoring mesh for LHC Tier-1 and Tier-2 sites”, Jeff Boote, Eric Boyd, Aaron Brown, Maxim Grigoriev, Joe Metzger, Phil DeMar, Martin Swany, Brian Tierney, Matt Zekauskas and Jason Zurawski, *CHEP2009*, March 2009.
- “The Evolution of Research and Education Networks and their Essential Role in Modern Science”, William E. Johnston, Evangelos Chaniotakis, Eli Dart, Chin Guok, Joe Metzger, Brian Tierney, *Trends in High Performance and Large Scale Computing*, Lucio Grandinetti and Gerhard Joubert editors, 2009. LBNL-2885E.
- “A User Driven Dynamic Circuit Network Implementation”, Chin Guok, David Robertson, Evangelos Chaniotakis, Mary Thompson, William Johnston, Brian Tierney, *Proceedings of the Distributed Autonomous Network Management Systems Workshop (DANMS 2008)*, November 2008.
- “Log Summarization and Anomaly Detection for Troubleshooting Distributed Systems”, J. Bresnahan, A. Brown, D. Gunter, J. M. Schopf, M. Swany, B. L. Tierney, *IEEE/ACM International Conference on Grid Computing (Grid 2007)*, Austin, TX, September 2007.
- “The NIDS Cluster: Scalable, Stateful Network Intrusion Detection on Commodity Hardware”, Matthias Vallentin, Robin Sommer, Jason Lee, Craig Leres, Vern Paxson, Brian Tierney, *Proc. Symposium on Recent Advances in Intrusion Detection*, Queensland, Australia, 2007
- “The CEDPS Troubleshooting Architecture and Deployment on the Open Science Grid”, Brian L. Tierney, Dan Gunter, Jennifer M. Schopf, *Proceedings of SciDAC 2007*, Boston, MA, 2007.
- “Intra and Interdomain Circuit Provisioning Using the OSCARS Reservation System”, C. Guok, D. Robertson, M. Thompson, J. Lee, B. Tierney and William Johnston, *Proceedings of the GridNETS 2006 workshop*. LBNL-60373

- “Scalable Analysis of Distributed Workflow Traces”, Daniel K. Gunter, Brian L. Tierney, and Stephan J. Bailey, *The 2005 International Conference on Parallel and Distributed Processing Techniques and Applications (PDPTA'05)*, LBNL-57060.
- “Essential Grid Workflow Monitoring Elements”, Daniel K. Gunter, Keith R. Jackson, David E. Konerding, Jason R. Lee and Brian L. Tierney, *The 2005 International Conference on Grid Computing and Applications (GCA'05)*, LBNL-57428.
- “A First Look at Modern Enterprise Traffic”, M. Allman, M. Bennett, J. Lee, V. Paxson, B. Tierney, *Usenix Internet Measurements Conference (IMC-2005)*, LBNL-57630.
- “Instrumentation and Monitoring”, B. Tierney and J. Hollingsworth, Chapter 20, *The Grid Blueprint for a New Computing Infrastructure*, 2nd Edition, Elsevier, 2003
- “System Capability Effects on Algorithms for Network Bandwidth Measurement”, G. Jin, B. Tierney, *Proceedings of the Internet Measurement Conference*, Oct. 27-29, 2003, Miami Beach, Florida, LBNL-48556
- “On-Demand Grid Application Tuning and Debugging with the NetLogger Activation Service”, D. Gunter, B. Tierney, C. E. Tull, V. Virmani, *4th International Workshop on Grid Computing (Grid2003)*, LBNL-52991
- “Enabling Network Measurement Portability Through a Hierarchy of Characteristics”, B. Lowekamp, B. Tierney, Les Cottrell, R. Hughes-Jones, T. Kielmann, M. Swamy, *4th International Workshop on Grid Computing (Grid2003)*, LBNL-53013.
- “An Infrastructure for Passive Network Monitoring of Application Data Streams”, D. Agarwal, J. M. González, G. Jin, B. Tierney, *Passive and Active Measurement Workshop*, April, 2003.
- “Dynamic Monitoring of High-Performance Distributed Applications”, D. Gunter, B. Tierney, K. Jackson, J. Lee, M. Stoufer, *Proceedings of the 11th IEEE Symposium on High Performance Distributed Computing*, July 2002..
- “Monitoring Data Archives for Grid Environments”, J. Lee, D. Gunter, M. Stoufer, B. Tierney, *Proceeding of IEEE Supercomputing 2002 Conference*, Nov. 2002.
- “A TCP Tuning Daemon”, T. Dunigan, M. Mathis and B. Tierney, *Proceeding of IEEE Supercomputing 2002 Conference*, Nov. 2002.
- “Enabling Network-Aware Applications”, B. Tierney, D. Gunter, J. Lee, M. Stoufer, *Proceedings of the 10th IEEE Symposium on High Performance Distributed Computing*, August 2001.
- “A Monitoring Sensor Management System for Grid Environments”, Tierney, B., B. Crowley, D. Gunter, J. Lee, M. Thompson, *Cluster Computing Journal*, vol 4-1, 2001, Baltzer Science Publications.
- “TCP Tuning Guide for Distributed Application on Wide Area Networks”, Tierney, B., *Usenix ;login*, Feb. 2001.
- “File and Object Replication in Data Grids”, Stockinger, H., Samar, A., Allcock, B, Foster, I., Holtman, K., Tierney, B., *Proceedings of the 10th IEEE Symposium on High Performance Distributed Computing (HPDC-10)*, August 2001
- “Using High-Speed WANs and Network Data Caches to Enable Remote and Distributed Visualization”, Bethel, W., Tierney, B., Lee, J., Gunter, D., Lau, S., *Proceeding of the IEEE Supercomputing 2000 Conference*, Nov. 2000.
- “A Grid Monitoring Service Architecture”, Tierney, B., Ruth Aydt, Dan Gunter, Warren Smith, Valerie Taylor, Rich Wolski, et.al., *Global Grid Forum White Paper*, <http://dsd.lbl.gov/GridPerf/>.
- “A Monitoring Sensor Management System for Grid Environments”, Tierney, B., B. Crowley, D. Gunter, M. Holding, J. Lee, M. Thompson, *Proceedings of the IEEE High Performance Distributed Computing (HPDC-9)*, August 2000.
- “A Data Intensive Distributed Computing Architecture for Grid Applications”, Tierney, B., Johnston, W., Lee, J., Thompson, M., *Future Generation Computer Systems Journal*, vol. 16, #5, April 2000, pp. 473-481.

Other Significant Publications

- “A Network-Aware Distributed Storage Cache for Data Intensive Environments”, Tierney, B. Lee, J., Crowley, B., Holding, M., Hylton, J., Drake, F., *Proceedings of IEEE High Performance Distributed Computing*, August 1999.
- “The NetLogger Methodology for High Performance Distributed Systems Performance Analysis”, B. Tierney, W. Johnston, B. Crowley, G. Hoo, C. Brooks, D. Gunter, *Proceeding of IEEE High Performance Distributed Computing*, July 1998.
- “Performance Analysis in High-Speed Wide Area ATM Networks: Top-to-bottom end-to-end Monitoring”, B. Tierney, W. Johnston, G. Hoo, J. Lee, *IEEE Network*, Vol. 10, no. 3, May/June 1996.
- “System Issues in Implementing High Speed Distributed Parallel Storage Systems”, Brian Tierney, Bill Johnston, Hanan Herzog, Gary Hoo, Guojun Jin, Jason Lee, *Proceedings of the USENIX Symposium on High Speed Networking*, Aug. 1994.

- “Distributed Parallel Data Storage Systems: A Scalable Approach to High Speed Image Servers”, Brian Tierney, Bill Johnston, Ling Tony Chen, Hanan Herzog, Gary Hoo, Guojun Jin, Jason Lee, *Proceedings of the ACM Multimedia*, October 1994.

Tutorials

Taught tutorials on network tuning and troubleshooting, performance analysis and tuning of distributed applications:

- Joint Techs Workshop, July 2010
- SciDAC 2007 Conference, June 2007
- IEEE SuperComputing Conference, Nov. 2006
- Networks for non-Networkers Workshop, Edinburgh, Scotland, June 2005
- IEEE SuperComputing Conference, Nov. 2000
- CERN School of Computing, Sep. 2000
- High Performance Distributed Computing Conference, Aug. 1999

Recent Collaborators

A. Chien (SDSC), L. Cottrell (SLAC), C. Dovorlis (Georgia Tech), Cees de Laat (U. Amsterdam), T. Dunigan (ORNL), W. Feng (LANL), I. Foster (ANL), D. Gannon (U. Indiana), C. Kesselman (USC/ISI), W. Johnston (ESnet), M. Mathis (PSC), R. Mount (SLAC), V. Paxson (LBNL), P. Kunst (CERN), R. Wolski (UT).

Graduate Students (MS) over past 5 years

Jason Lee (LBNL), Dan Gunter (LBNL), Mason Holding (scale8).

Selected Professional Activities

- Global Grid Forum (GGF): Working Group Chair of 3 different working groups, and NOMCOM Chair
- Member of IEEE Computer Society